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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/697,088	10/25/2000	Manabu Kitamura	16869P015200	3076

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EXAMINER	
BATES, KEVIN T	

ART UNIT	PAPER NUMBER
2155	

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/697,088	KITAMURA ET AL.	
	Examiner	Art Unit	
	Kevin Bates	2155	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

This Office Action is in response to a communication made on November 26, 2004.

Claims 18 – 36 are pending in this application.

Claim Objections

Claim 24 is objected to because of the following informalities: In line 15, the word "fourth" is misspelled. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 18-20, 23-27, 29-31, and 34-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Gagne (6401178).

Regarding claim 18, Gagne discloses a method of sharing data in a computer system (Column 2, lines 42 – 48), said computer system comprising a first computer, a second computer (Column 2, lines 56 – 57, where it doesn't matter if the programs are running on one device or a plurality of devices), and a storage system comprising a disk control unit (Column 4, lines 46 – 48), a first disk unit, a second disk unit, and a third disk unit (Column 2, lines 54 – 56), the method comprising: forming a duplex state

between said first disk unit and said second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein said disk control unit, in response to a write request from said first computer, stores write data associated therewith to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21); forming a simplex state, wherein said disk control unit, in response to a write request from said first computer, stores write data associated therewith only to said first disk unit (Column 2, lines 59 – 62); and subsequent to said step of forming a simplex state, re-mapping a disk identifier, said second computer using said disk identifier to access said storage system, wherein said disk identifier is associated with said third disk unit before said re-mapping and said disk identifier is associated with said second disk unit after said re-mapping, whereby said third disk unit is accessed when said second computer accesses said storage system at a time prior to said re-mapping and said second disk unit is accessed when said second computer accesses said storage system at a time subsequent to said re-mapping (Column 7, lines 40 – 57; Column 8, lines 51 – 54, where the disclosure while "establishing a duplex" takes the user/application of the data storage device and moves its association to another BCV mirror and when the "duplex is split" the data storage device once again is reassigned the user/application).

Regarding claim 19, Gagne discloses that subsequent to said step of re-mapping, forming a duplex state between said first disk unit and said third disk unit (Column 2, lines 54 – 62, where when one disk unit is split from the first disk unit, the other can be established as a mirror).

Regarding claim 20, Gagne discloses method of sharing data in a computer system (Column 2, lines 42 – 48), said computer system comprising a first computer, a second computer (Column 2, lines 56 – 57, where it doesn't matter if the programs are running on one device or a plurality of devices), and a storage system comprising a disk control unit (Column 4, lines 46 – 48), a first disk unit, a second disk unit, a third disk unit (Column 2, lines 54 – 56), and a fourth disk unit (Column 12, lines 36 – 44), the method comprising: forming a duplex state between said first disk unit and said second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein said disk control unit, in response to a write request from said first computer, stores write data associated therewith to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21); forming a simplex state, wherein said disk control unit, in response to a write request from said first computer, stores write data associated therewith only to said first disk unit (Column 2, lines 59 – 62); and subsequent to said step of forming a simplex state, copying data stored in said second disk unit to said third disk unit (Column 12, lines 52 – 44) and re-mapping a disk identifier, said second computer using said disk identifier to access said storage system, wherein said disk identifier is associated with said fourth disk unit before said re-mapping and said disk identifier is associated with said third disk unit after said re-mapping, whereby said fourth disk unit is accessed when said second computer accesses said storage system at a time prior to said re-mapping and said third disk unit is accessed when said second computer accesses said storage system at a time subsequent to said re-mapping (Column 7, lines 40 – 57; Column 8, lines 51 – 54, where the disclosure while "establishing a duplex" takes the

user/application of the data storage device and moves its association to another BCV mirror and when the "duplex is split" the data storage device once again is reassigned the user/application).

Regarding claim 23, Gagne discloses that said computer system further comprises a processor coupled to said storage system, and said step of copying data is performed by said processor (Column 8, lines 35 – 44).

Regarding claim 24, Gagne discloses a method of sharing data in a computer system (Column 2, lines 42 – 48), said computer system comprising a first computer, a second computer (Column 2, lines 56 – 57, where it doesn't matter if the programs are running on one device or a plurality of devices), and a storage system comprising a first disk unit accessed from said first computer, a second disk unit, a third disk unit storing a copy of data that was stored in said first disk unit at a first time, a fourth disk unit accessed from said second computer (Column 2, lines 54 – 57; Column 12, lines 36 – 44), and a disk control unit accessing one or more of said disk units (Column 4, lines 46 – 48), the method comprising steps of updating data stored in said first disk unit and storing update data and its address to said second disk unit, in response to a write request from said first computer, wherein said update data and its address are determined from said write request (Column 2, lines 62 – 67; Column 3, lines 8 – 21); writing check points to said second disk unit in response to transactions executed by said first computer; updating data stored in said third disk unit by reading update data stored in said second disk unit and writing said update data to said third disk unit according to said checkpoints (Column 10, lines 42 – 60; Column 13, lines 5 – 14; lines

42 – 50); forming a duplex state between said third disk unit and said forth disk unit by copying data stored in said third disk unit to said fourth disk unit (Column 12, lines 52 – 55); and after copying data stored in said third disk unit to said fourth disk unit, accessing said fourth disk unit from said second computer (Column 8, lines 52 – 55).

Regarding claim 25, Gagne discloses that said computer system further comprises a processor coupled to said storage system, and said step of updating data stored in said third disk unit is executed by said processor (Column 8, lines 35 – 44).

Regarding claim 26, Gagne discloses that said processor maintains a checkpoint designating a latest accessed update data in said second disk unit, and said step of updating data stored in said third disk unit includes steps of reading update data stored in said second disk unit (Column 5, line 64 – Column 6, line 12), said update data being designated by a checkpoint maintained in said processor and said latest check point stored in said second disk unit; and writing said update data read from said second disk unit to said third disk unit (Column 10, lines 42 – 54).

Regarding claim 27, Gagne discloses a method of sharing data in a computer system (Column 2, lines 42 – 48), said computer system comprising a first computer, a second computer, a first storage system coupled to said first computer and comprising a first disk unit and a first disk control unit, and a second storage system coupled to said second computer and comprising a second disk unit, a third disk unit, a fourth disk unit, and a second disk controller unit (Column 2, lines 56 – 57, where it doesn't matter if the programs are running on one device or a plurality of devices; Column 2, lines 54 – 57; Column 12, lines 36 – 44), wherein said first disk control unit and said second disk

control unit are coupled via a network (Column 5, lines 5 – 7), the method comprising steps of copying data stored in said first disk unit to said second disk unit via said network; forming a duplex state between said first disk unit and said second disk unit, wherein said first disk control unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), in response to a write request from said first computer, stores write data associated therewith to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21); forming a simplex state, wherein said first disk control unit, in response to a write request from said first computer, stores write data associated therewith only to said first disk unit; and subsequent to said step of forming a simplex state (Column 2, lines 59 – 62), copying data stored in said second disk unit to said third disk unit (Column 12, lines 52 – 44) and re-mapping a disk identifier, said second computer using said disk identifier to access said storage system, wherein said disk identifier is associated with said fourth disk unit before said re-mapping and said disk identifier is associated with said third disk unit after said re-mapping, whereby said fourth disk unit is accessed when said second computer accesses said storage system at a time prior to said re-mapping and said third disk unit is accessed when said second computer accesses said storage system at a time subsequent to said re-mapping (Column 7, lines 40 – 57; Column 8, lines 51 – 54, where the disclosure while "establishing a duplex" takes the user/application of the data storage device and moves its association to another BCV mirror and when the "duplex is split" the data storage device once again is reassigned the user/application).

Regarding claim 29, Gagne discloses a storage system comprising: a disk control unit (Column 4, lines 46 – 48); and a plurality of disk units (Column 2, lines 54 – 56), wherein said disk control unit is operable to form a duplex state between a first disk unit and a second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein data associated with a write request from a first computer is stored to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21), wherein said disk control unit is further operable to form a simplex state between said first disk unit and said second disk unit, wherein data associated with a write request from said first computer is stored only to said first disk unit (Column 2, lines 59 – 62), wherein during said simplex state, data stored in said second disk unit is copied to a third disk unit (Column 12, lines 52 – 44) and a disk identifier is re-mapped, wherein a second computer uses said disk identifier to access said storage system, wherein before said disk identifier is re-mapped, it is associated with said third disk unit so that said third disk unit is accessed when said second computer accesses said storage system, wherein after said disk identifier is re-mapped, it is associated with said second disk unit so that said second disk unit is accessed when said second computer accesses said storage system (Column 7, lines 40 – 57; Column 8, lines 51 – 54, where the disclosure while "establishing a duplex" takes the user/application of the data storage device and moves its association to another BCV mirror and when the "duplex is split" the data storage device once again is reassigned the user/application).

Regarding claim 30, Gagne discloses that subsequent to said step of re-mapping, forming a duplex state between said first disk unit and said third disk unit

(Column 2, lines 54 – 62, where when one disk unit is split from the first disk unit, the other can be established as a mirror).

Regarding claim 31, Gagne discloses a storage system comprising: a disk control unit (Column 4, lines 46 – 48); and a plurality of disk units (Column 2, lines 54 – 56), wherein said disk control unit is operable to form a duplex state between a first disk unit and a second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein data associated with a write request from a first computer is stored to both said first disk unit and to said second disk unit (Column 3, lines 8 – 21), wherein said disk control unit is further operable to form a simplex state, wherein data associated with a write request from said first computer is stored only to said first disk unit, wherein during said simplex state (Column 2, lines 59 – 62), data stored in said second disk unit is copied to a third disk unit (Column 12, lines 52 – 44) and a disk identifier is re-mapped, wherein a second computer uses said disk identifier to access said storage system, wherein before said disk identifier is re-mapped, it is associated with a fourth disk unit so that said fourth disk unit is accessed when said second computer accesses said storage system, wherein after said disk identifier is re-mapped, it is associated with said third disk unit so that said third disk unit is accessed when said second computer accesses said storage system (Column 7, lines 40 – 57; Column 8, lines 51 – 54, where the disclosure while "establishing a duplex" takes the user/application of the data storage device and moves its association to another BCV mirror and when the "duplex is split" the data storage device once again is reassigned the user/application).

Regarding claim 34, Gagne discloses a storage system comprising: a disk control unit (Column 4, lines 46 – 48); and a plurality of disk units (Column 2, lines 54 – 56), wherein said disk control unit is operable to: update data stored in a first disk unit and store update data and its address to a second disk unit, in response to a write request from a first computer, said update data and its address being determined from said write request (Column 2, lines 62 – 67; Column 3, lines 8 – 21); write checkpoints to said second disk unit in response to transactions executed by said first computer; update data stored in a third disk unit by reading update data stored in said second disk unit and write said update data to said third disk unit according to said checkpoints (Column 10, lines 42 – 60; Column 13, lines 5 – 14; lines 42 – 50); form a duplex state between said third disk unit and a fourth disk unit by copying data stored in said third disk unit to said fourth disk unit (Column 12, lines 52 – 55); and service data access requests from a second computer by accessing said fourth disk unit (Column 8, lines 52 – 55).

Regarding claim 35, Gagne discloses a storage system comprising: a disk control unit (Column 4, lines 46 – 48); a plurality of disk units (Column 2, lines 54 – 56); and a network connecting at least some of said disk units (Figure 1, element 36), wherein said disk control unit is operable to copy data stored in a first disk unit to a second disk unit via said network, wherein said disk control unit is operable to form a duplex state between said first disk unit and said second disk unit, wherein data associated with a write request from a first computer is stored to both said first disk unit and to said second disk unit (Column 2, lines 62 – 67; Column 3, lines 8 – 21), wherein

said disk control unit is further operable to form a simplex state, wherein data associated with a write request from said first computer is stored only to said wherein during said simplex state (Column 2, lines 59 – 62), data stored in said second disk unit is copied to a third disk unit (Column 12, lines 52 – 44) and a disk identifier is re-mapped, wherein a second computer uses said disk identifier to access said storage system, wherein before said disk identifier is re-mapped, it is associated with said third disk unit so that said third disk unit is accessed when said second computer accesses said storage system, wherein after said disk identifier is re-mapped, it is associated with said second disk unit so that said second disk unit is accessed when said second computer accesses said storage system (Column 7, lines 40 – 57; Column 8, lines 51 – 54, where the disclosure while "establishing a duplex" takes the user/application of the data storage device and moves its association to another BCV mirror and when the "duplex is split" the data storage device once again is reassigned the user/application)..

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21-22, 28, 32-33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gagne in view of Misiani (5758125).

Regarding claim 21, 28, 32, and 36, Gagne does not explicitly indicate the step of copying the contents of the second memory unit to the third memory unit includes a step

of converting a first data format stored in the second memory unit for use by the first computer into a second data format for use by the second computer. Misinai teaches a secondary storage controller that copies the contents of the second memory unit to the third memory unit includes a step of converting a first data format stored in the second memory unit for use by the first computer into a second data format for use by the second computer (Column 2, lines 12 – 19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Misinai's storage system controller to allow heterogeneous computer systems to share memory in the storage subsystem (Column 1, lines 48 – 55).

Regarding claims 22 and 33, the combined invention of Gagne in view of Misinai from the rejection to claim 21, includes the step of converting data from the first data format to the second data format is based on interfaces among the first computer, the second computer and the data storage subsystem (Column 2, lines 21 – 40, Misinai).

Response to Arguments

The applicant argues that the reference Gagne, does not disclose the re-mapping of disk identifiers. The examiner disagrees, in the reference Gagne discloses that there are disk identifers (Column 5, lines 17 - 29) and the re-mapping works because when data is mirrored, all data writes go towards the standard device and are mirrored to the BCV devices, but when the simplex is formed after the mirroring ends, different applications are mapped to different storages devices to work in parallel (Column 6, lines 16 - 29).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Bates whose telephone number is (571) 272-3980. The examiner can normally be reached on 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (571) 272-3978. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KB

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December 8, 2004

HOSAIN ALAM
SUPERVISORY PATENT EXAMINER